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AGRICULTURE IN YUGOSLAVIA

/The following report is based on an article in Informativni prirucnik o Jugoslaviji, a handbook published in sections since late 1948 by the Yugoslav Directorate for Information.

Figures referred to are appended./

Yugoslavia is preponderantly an agricultural country. According to the 1931 census, 76.6 percent of the population made their living from agriculture, forestry, and fishing. Out of each 100 persons who earn their own living, 76.3 percent are employed in agriculture. In Yugoslavia, 72.3 percent of all men who earn their living are employed in agriculture, and 83.3 percent of all women who earn their living are employed in the same pursuit.

The largest number of persons employed in agriculture are in the Sandzak (89.3 percent), the Kosmet (85.8 percent), and in Bosnia-Hercegovina (84.1 per cent), while the smallest number of persons employed in agriculture are in Slovenia (60.6 percent) and the Vojvodina (69.2 percent). In Serbia, 79.3 percent of the people are employed in agriculture,; in Montenegro, 78.1 percent; in Croatia, 76.3 percent; and in Macedonia, 75.[illegible] percent.

The high percentage of the population engaged in agriculture is not indicative of especially favorable conditions for agriculture but is indicative of economic underdevelopment. Before World War II, primarily because of backwardness and poor agricultural mechanization, agricultural production represented about one half the national income of Yugoslavia, whereas three fourths of the population was engaged in agriculture. Of the total agricultural production, 55 to 61 percent was devoted to the cultivation of crops, and the remainder to livestock.

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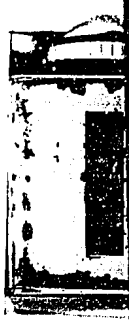


The agricultural area (arable land, gardens, orchards, vineyards, meadows, pastures, reed thickets, and marshes) totals 13,757,000 hectares or 53.6 percent of the total area of Yugoslavia (25,688,000 hectares). Thirty-one percent of the country's total area is arable. In Montenegro, 6 percent of the total area is arable; in Slovenia, 18 percent; in Macedonia, 23 percent; in Croatia, 29 percent; in Serbia proper, 35 percent; in the Kosmet, 38 percent; and in the Vojvodina, 71 percent.

Figure 1 shows the number of inhabitants per square kilometer of total area and per square kilometer of arable land and gardens (not including orchards and vineyards) in the republics.

The production of cereals per inhabitant in the Vojvodina was 1,612 kilograms in 1939, bringing the average per inhabitant for Yugoslavia to 580 kilograms. Cereal production per inhabitant in Montenegro was 123 kilograms; in Slovenia, 191; in Bosnia-Hercegovina, 392; in Macedonia, 400; in Croatia, 429; in the Kosmet, 447; and in Serbia proper, 567.

The production of cereals per person employed in agriculture in the Vojvodina was 4,720 kilograms in 1939 whereas the average per person employed in agriculture in Yugoslavia was only 1,580 kilograms. In Montenegro, the average was 355 kilograms; in Slovenia, 585 kilograms; in Bosnia-Hercegovina, 1,070 kilograms; in Croatia, 1,110 kilograms; in Macedonia, 1,260 kilograms; in the Kosmet, 1,235 kilograms; and in Serbia proper, 1,480 kilograms.

In 1939, the average arable land per agricultural producer in Montenegro was 0.6 hectares; in Slovenia, 0.9 hectare; in Croatia, 1.1 hectares; in the Kosmet, 1.4 hectares; in Serbia, 1.4 hectares; in Bosnia-Hercegovina, 1 .5 hectares; in Macedonia, 1.5 hectares; and in the Vojvodina, 3 hectares.

LANDOWNING AND AGRARIAN REFORM

At the end of World War I, feudal relations still existed in Bosnia-Hercegovina, Dalmatia, and Macedonia. Although agrarian reforms which partly abolished feudal relations were carried out after World War I, a rapid increase in the population and an ever increasing penetration of capitalism into the villages were pauperizing small farmers. By World War II the population of Yugoslavia had increased by about 4 million. Most of the population increase was in the villages, where it caused the further subdivision of already small farms. Simultaneously, large farms were increased at the expense of small ones. Capitalism was speeding up the process of pauperizing small farmers by creating a rural proletariat which was forced to sell its labor. As the supply of labor was usually much greater than the demand, agricultural wages were very low, particularly in regions where the overpopulation was greatest. Consequently, economic stimulus to the mechanization of agriculture was proportionately slight.

The first and sole census of agricultural property in prewar Yugoslavia, which was taken in 1931 after the agrarian reform had been completed, showed the following. One third of the total number of farms were less than 2 hectares in area, one third were 2 to 5 hectares in area, and one third were over 5 hectares in area. However, farms of less than 2 hectares constituted 6.5 percent of the total agricultural area; farms of 2 to 5 hectares, 21.5 percent; and farms of over 5 hectares, 72 percent. Farms of 20 to 50 hectares constituted 2.5 percent of the total number of farms and 13.5 percent of the total agricultural area. Farms of over 50 hectares constituted 0.5 percent of the total number of farms and 9.1 percent of the total agricultural area.

Since farms of less than 2 hectares could not supply the needs of a farm family, the family had to seek additional income, or it gradually sold off the land and other production means and joined the rural proletariat. Farms of 2 to 5 hectares could supply sufficient food for a family's needs but were not in a position to sell any large marketable surpluses or invest in production. Such a goal could be achieved only by farms of more than 10 hectares.

The 1931 census is very inaccurate. The total arable land shown by the census totaled 5,702,000 hectares, whereas the land register for the same year showed 7,042,000 hectares of arable land. If it is assumed that the actual area of arable land was greater than that shown by the land register and that the census also gave incomplete data on other items, the situation of farmers in 1931 was somewhat better than was shown by the census. However, since the effects of the great agricultural crisis began to be felt only after 1931, and since the population increased by about 2 million from 1931 to the beginning of 1939, then the situation of the poor farmers at the beginning of World War II was worse than was shown by the 1931 census.

In a study of agrarian relationships, statistics on land ownership as well as statistics on the number and size of farms must be taken into consideration. There are no such statistics for prewar Yugoslavia. The 1931 census shows how much of the total agricultural area was owned and how much was rented, but it does not show the size of the categories which rented out the land or leased it on a sharecropping basis.

The agrarian reform after World War II, based on the principle of "Land to Those Who Work It," aimed to eliminate, to the greatest possible extent, social injustices inherent in the former land distribution by liquidating large private farms and by reducing the capitalist sector in agriculture.

Under this reform, 1,561,000 hectares of land were taken over, 1,070,000 hectares of which were arable and the remainder mostly forests. The land taken over was composed of land abandoned by the Germans, land from farms of 20 to 35 hectares, land of convicted Fascists, and land of persons who had not been farming it themselves.

Land taken over was distributed primarily to poor farmers in the villages where it was taken over; 246,000 families thus received 439,000 hectares of land. Land abandoned by the Germans was used for resettling farm veterans from overpopulated agriculturally backward areas and for creating state farms. By mid-1947, approximately 45,000 families had been resettled in the Vojvodina on 258,000 hectares of arable land. On the whole, about 330,000 families received over 850,000 hectares of arable land as a result of the reform. Farmers were also given, free of charge, farm equipment collected from the abandoned farms.

Figure 2 shows the changes in ownership in the Vojvodina resulting from the agrarian reform.

STATE FARMS AND ECONOMIC UNITS

In prewar Yugoslavia the state sector included 77,000 hectares of land, which consisted of 8 state farms, 7 stud farms, and about 150 nurseries and agricultural stations. Since all of these were a part of the capitalist system, they showed no effect in advancing agriculture.

In postwar Yugoslavia, the state sector in agriculture represents one of the main instruments for the socialist transformation of Yugoslav agriculture and for the transformation of backward agricultural production into progressive and efficient production. One of the functions of the state sector is to show: (1) the advantages of applying modern techniques and mechanization and increasing work productivity; and (2) the advantages of planned production based on socialist principles. The other important function of the state sector, primarily of the state farms, is to increase agricultural production, particularly for the city population, as well as the production of selective seeds, livestock for breeding, and the like.

The state sector in agriculture comprises federal, republic, provincial, and local state farms; agricultural establishments (schools and the like); experiment stations; farms of industrial and other enterprises, establishments, social organizations; and the like. The state sector also includes agricultural-machinery stations and other enterprises (seed enterprises and the like).

In 1946, the federal Ministry of Agriculture and the republic ministries of agriculture established 11 federal farms and 106 republic farms. In 1947, planned production was introduced on these farms. In 1947, there were 430 state farms totaling 194,813 hectares; in 1948, 210 farms totaling 288,107 hectares; and in 1949, 258 farms totaling 323,366 hectares. At the beginning of 1949, the state sector of agriculture on the local level embraced 113,000 hectares. Land of local state farms, economic units, and establishments brings the agricultural area of the state sector up to 500,000 hectares. In Serbia, where the state sector is the most developed, it includes over 260,000 hectares (mid-1949). State farms are important not only in advancing agriculture, but also in agricultural production, particularly in the production of vegetables and livestock. As early as 1948, state farms produced 154,031 tions of cereals or 2 percent of the total cereals produced, 1,072,000 fruit seedlings, and 3,201,000 grapevines.

In 1946, owing to the war devastation, livestock was reduced in number and was of very poor quality. By the end of 1948, the state sector had 18,957 horses, 54,820 head of cattle, 295,095 hogs, 255,003 sheep, and 271,716 chickens, ducks, and other domesticated birds.

State farms have also made considerable progress in intensive farming. Utilization of better agricultural techniques is reflected in crop yields per hectare. In 1948, the yield of wheat on state farms was 1.76 metric centners higher than on adjacent private farms, and 1.19 metric centners higher than the average for Yugoslavia.

Farms of enterprises, establishments, people's councils, and social organizations, which total nearly 200,000 hectares, were developed particularly in 1948 and 1949 near industrial centers and large cities. Although a large number of these farms are still in the developmental stage, they already are an important factor in providing additional supplies to the work collectives of factories, state establishments, and the like. Their production is directed toward vegetable growing and livestock products, such as lard, milk, eggs, and the like.

AGRICULTURAL MACHINERY STATIONS AND MECHANIZATION OF AGRICULTURE

Prewar Yugoslavia ranked next to last in Europe in use of agricultural machinery. There were about 400,000 wooden plows in Yugoslavia; about 50 percent of farm households owned a plow. Domestic production of agricultural

machinery was low, while import of large agricultural machinery was difficult because of high cost. Tractors, of which there were about 3,000, were used only in certain areas (the Vojvodina and Eastern Slavonia) by large landowners and rich farmers. The low degree of mechanization resulted in Yugoslavia's having the lowest crop yields in Europe.

In postwar Yugoslavia, the establishment of PMS (poljoprivredno-masinske stanice) agricultural machinery stations, began immediately after the liberation.

The number of PMS has increased as follows:

1945	69 PMS with 2,844 tractors
1946	71 PMS with 3,917 tractors
1947	98 PMS with 4,236 tractors
1948*	109 PMS with 3,820 tractors

* The decrease resulted from the turning over of about 300 tractors to state farms and of about 200 to farm work cooperatives.

In addition to tractors, PMS have the following agricultural machines (approximate numbers):

Tractor-drawn plows	4,000
Tractor-drawn cultivators	1,200
Tractor-drawn disc harrows	1,500
Tractor-drawn fertilizers	600
Tractor-drawn seeders	900
Tractor-drawn binders	2,000
Tractor-drawn reapers	250
Tractor-drawn mowers	500
Threshers	2,600
Combines	8
Locomobiles	500
Motors	1,000

The work of PMS is carried out in brigades of three to five tractors, headed by a brigadier. PMS have about 650 brigades with 3,600 tractor operators.

PMS are distributed as follows:

Serbia	55
Croatia	21
Slovenia	7
Bosnia-Hercegovina	17
Macedonia	8
Montenegro	1

In Serbia, there are PMS in Mladenovac, Pozarevac, Zajecar, Sabac, Valjevo, Cacak, Kragujevac, Svetozarevo, Krusevac, Leskovac, Nis, Prokuplje, Pristina, Pec, Urosevac, Vucitrn, Apatin, Backi Jarak, Zabalj, Backi Brestovac, Backa Palanka, Backa Topola, Kula, Vrbas, Odzaci, Bac, Zmajevo, Lovcenac, Stanisic, Sivac, Senta, Subotica, Kolut, Sombor, Titel, Stari Becej, Kikinda, Vrsac, Bela Crkva, Zrenjanin, Lazarevo, Jasa Tomic, Jabuka, Kovin, Plandiste, Pancevo, Omoljica, Srpska Crnja, Veliko Selo, Cestereg, Sremska Mitrovica, Indjija, Sid, Ruma, and Surcin.

In Croatia, there are PMS in Osijek, Beli Manastir, Vukovar, Ilok, Vinkovci, Valpovo, Nasice, Slavonski Brod, Djakovo, Zupanja, Slavonska Pozega, Nova Gradiska, Daruvar, Podravska Slatina, Virovitica, Koprivnica, Bjelovar, Novska, Zagreb, Sisak, and Karlovac.

In Slovenia, there are PMS in Ljubljana, Novo Mesto, Brezice, Celje, Maribor, Murska Sobota, and Ajdovscina.

In Bosnia-Hercegovina, there are PMS in Bijeljina, Brcko, Modric, Bosanski Brod, Derventa, Prnjavor, Doboj, Maglajani, Banja Luka, Nova Topola, Prijedor, Bosanska Dubica, Bihac, Sarajevo, Mostar, Trebinje, and Livno.

In Macedonia, there are PMS in Madzari, Bitolj, Prilep, Sveti Nikola, Kumanovo, Negotino, Tetovo, and Strumica.

In Montenegro, there is a PMS in Titograd.

PMS tractors did preliminary plowing of 232,657 hectares in 1945; 615,947 hectares in 1946; 832,244 hectares in 1947; and 860,000 hectares in 1948.

PMS threshers threshed 5,318 wagon loads in 1945; 39,907 wagon loads in 1946; 42,505 wagon loads in 1947; and 61,087 wagon loads in 1948.

In 1946, PMS tractors did deep plowing of 33,096 hectares and disk plowing of 18,346 hectares; in 1947, deep plowing of 143,000 hectares and disk plowing of 64,514 hectares; and in 1948, deep plowing of 136,564 hectares and disk plowing of 55,539 hectares.

PMS divided their work as follows (in percent):

	State Sector	Farm Work Cooperatives	Private Sector
1947	34	24	42
1948	37	30	33

PMS are builders of socialist society in villages. They are a powerful lever for the development of Yugoslav agricultural cooperatives, particularly of higher-type cooperatives, farm work cooperatives.

PMS attract farmers to cooperative cultivation of land and strengthen existing farm work cooperatives. PMS free farmers from hard physical labor, make possible a larger flow of manpower from village to industry, and free farmers from dependence on speculators.

Tractors are distributed as follows:

PMS	3,820
State farms	990
Farm work cooperatives	200
Private Sector	1,600
Total	6,610

Endeavors are being made to mechanize state farms completely as soon as possible, to serve as a model for mechanization in other sectors. It is also important to mechanize farm-work cooperatives completely, since mechanization is necessary for their development. Privately owned tractors and other large agricultural machines, which are mostly obsolete, are being assigned planned tasks in plowing, threshing, harvesting, and the like.

The 1951 plan calls for the following as compared with 1948:

	1948	1951
Number of PMS	109	100
Tractors	2,600	4,500
Threshers	3,820	5,000
Preliminary plowing by tractors (in hectares)	860,000	1,350,000
Area plowed per tractor (in hectares)	211	300

The level of mechanization in Yugoslavia is still low. For instance, plowing is mechanized (by tractor) 7 percent; sowing, 1 percent; disk plowing, 8 percent; deep ploughing, 11 percent; harvesting, 4 percent; and threshing, 75 percent.

CROP FARMING

In prewar Yugoslavia, crop farming and other branches of agriculture were characterized by backwardness and by a lack of crop selectivity. In the mountainous regions of Bosnia, Montenegro, Macedonia, and other parts, crop rotation was largely unknown. Exhausted land was left idle because efficient methods of restoring fertility to it were generally unknown. Important agricultural methods, such as fallowing stubble fields, deep winter plowing, use of improved seeds, use of artificial fertilizers, and the like were almost unknown, especially in Macedonia, Montenegro, and Bosnia-Hercegovina. Cultivation by tractor was likewise unknown to the poor farmer, for use of mechanized equipment was the exclusive privilege of rich landowners and rich farmers.

The backwardness of crop farming is shown by the following. Almost all crop yields in Yugoslavia were smaller than crop yields in other European countries. Yugoslavia was last in Europe in the use of mineral fertilizers. In 1945, 24.6 percent of the plows were large wooden plows and 17.9 percent were small wooden plows. Little use was made of tractors, threshers, or other motor-powered agricultural machines. About 8.4 percent of the soil was left fallow. Eighty-six percent of the sowable soil was in cereals, 2 percent in industrial crops, 6 percent in garden crops, and 4.7 percent in fodder crops, with two-field crop rotation predominating. Since poor farmers did not have enough horses and oxen, there was a shortage of stable manure. Consequently, small farms more and more turned from two-field to single-field crop rotation.

Because of variations in climate, soil, and geographic conditions, and above all because of unprogressive farming techniques and unsystematic irrigation and drainage methods, floods, hail, frost, drought, and the like occurred on a vast scale almost regularly. Measures taken by the state to protect farmers from these adverse condition were insignificant, and insurance against them was generally handled by private enterprises, constituting another form of plundering the poor farmer.

During the occupation, the area under cultivation decreased; livestock, implements, and buildings were destroyed; cultivation was poor; and production in general was upset. The German and Italian Fascists completely destroyed 289,000 farm households, burned, destroyed or damaged 432,660 rural dwellings and farm buildings, and destroyed and plundered surrounding property. A total of 798,132 horses, 2,397,343 cattle, and 6,824,000 sheep and goats were carried off as loot; 1,530 tractors, 2,480 steam locomobiles, 5,300 motors, 5,903 winnowing machines and selectors, 12,830 threshers, 1,500 tractor-plows, 495,890 plows, 485,000 horse- or ox-drawn wagons were destroyed or damaged.

From 1945 to 1947, the task in crop farming was to cultivate and sow agricultural areas chiefly in cereals and then meet the ever-increasing requirements for industrial plants. Another important task was to renew agricultural equipment, farm buildings, and livestock, so agricultural machinery stations were created, state farms expanded, agrarian reform and resettlement carried through, the first farm work cooperatives organized, and the like. In 1945-46, almost every area under cultivation before the war was sowed. In addition, as compared with 1939, the fodder crop area was increased 0.2 percent and the industrial plant area, 1.3 percent.

The Five-Year Plan calls for increasing the production of cereals over the 1939 level by 13 percent while decreasing the area in cereals by 8 percent and increasing the area in the following crops: industrial plants, 2.4 times; cotton, 6 times; sugar beets, 3.7 times; hemp, 2.7 times; sunflowers, 7 times; tobacco, 3.5 times; fodder crops, 2.5 times; and garden crops, 2.5 times. The plan calls for increasing the industrial crop yield 8-30 percent and for increasing the sowable area 5 percent by liquidating fallow lands, by plowing meadows and pastures, and by using irrigation and drainage.

The sowable area in 1939 was 7,235,000 hectares; in 1947, 7,085,000 hectares; and in 1948, 7,344,000 hectares.

The production of more important crops was as follows (in metric centners):

	10-Yr Avg	1947	1948
Cereals, Total*	768,060	754,494	870,775
Wheat	239,831	185,103	275,185
Corn	425,394	507,584	479,206
Oats	31,198	29,666	41,786
Barley	40,794	32,141	41,826
Rice	394	775	951
Industrial Plants			
Sugar beets	61,606	139,017	145,754
Hemp	19,500	24,561	45,665
Flax	--	2,437	2,340
Cotton	234	790	623
Sunflowers	1,654	14,553	12,976

* [This total probably includes other cereals not listed here.]

In 1948, through the application of better technical agricultural measures, the use of quality seed, and better work organization, the following average yields per hectare were achieved (in metric centers): wheat, 13.6; corn, 17.5; sugar beets, 167.7; sunflowers, 11.5; and hemp, 56.8.

MAIN TYPES OF SOIL

Yugoslavia has seven main types of soil as follows:

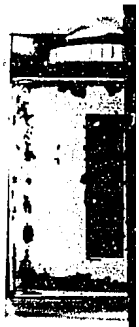
Chernozem is a mild, fertile soil found in dry areas. In Yugoslavia, it is found in the Vojvodina and eastern Slavonia.

Podzol is a soil of average fertility found in humid and cool areas. In Yugoslavia, this is the most common soil, prevailing in the western half of the country.

Gajnjaca is a fertile soil of medium humidity, found in moderately warm areas, especially in Serbia and Macedonia.

Smonica is similar to gajnjaca except that it is black, generally found in Serbia and Macedonia.

Crvenica or red earth is a soil found in the Primorje, Hercegovina, Montenegro, and Macedonia. It is suitable for tobacco, grapevines, and fruit trees.



Naplavina or river valley soil is alluvial soil along rivers.

Slatina or saline soil is the poorest soil because it contains a large quantity of salts. Such soil is found in the Vojvodina and Macedonia.

Of the total area of Yugoslavia, 29.3 percent is 0-200 meters above sea level; 25.4 percent, 200-500 meters; 27.4 percent, 500-1,000 meters; 14 percent, 1,000-1,500 meters; 3.4 percent, 1,500-2,000 meters; and 0.5 percent, over 2,000 meters.

Of the area up to 200 meters above sea level, 20.1 percent is in the Vojvodina and Slavonia, and 9.2 percent along the large rivers, particularly along the right bank of the Sava River and the sea coast. The high area stretches from Slovenia across western Croatia, Bosnia, and Serbia and crosses into southern Serbia and Macedonia, Hercegovina, and Montenegro and a good part of Dalmatia.

CROP-FARMING AREAS

Yugoslavia can be divided into three areas.

The wheat-growing area, which embraces 20 to 35 percent of the agricultural area, includes the Vojvodina, eastern Slavonia, and the valleys of the Sava, the Danube, and the Morava rivers.

The mountainous livestock-raising area, which covers more than 50 percent of the agricultural area, includes meadows and pastures with altitudes of more than 500 meters above sea level. Corn and oats are the predominant cereals grown in this area.

The subtropical area stretches into Macedonia and along the Adriatic Sea. Corn is the predominant cereal grown; the area excels in subtropical industrial crops, such as cotton, tobacco, sesame, peanuts, aniseed, opium poppies, and the like.

The average wheat yield per hectare in the wheat-growing area is over 16 metric centners, and the average corn yield is over 23 metric centners. In the mountainous livestock-raising area, the wheat yield per hectare is 10-12 metric centners, and the corn yield is 14-16 metric centners. In the subtropical area, the wheat yield per hectare is 7-9 metric centners, and corn yield is up to 10 metric centners.

The Vojvodina and eastern Slavonia are favorable for growing sugar beets, sunflowers, and hemp. The subtropical areas in Macedonia and along the Adriatic coast are favorable for growing cotton, opium poppies, aniseed, sesame, and peanuts. Considerable areas have vineyards and orchards.

The basic groups of Yugoslav crops are cereals, industrial crops, garden crops, and fodder crops. The percent of sowable area devoted to these groups has been as follows (in percent):

	Cereals	Industrial Crops	Garden Crops	Fodder Crops
1921	86.2	1.6	7.1	5.1
1931	87.9	2	5.9	4.2
1939	86.3	2.8	5.9	5
1945	84.7	2.9	7.2	5.2
1946	84.1	4.2	6.4	5.3
1947	81.7	4.8	6.5	7
1948	82.3	5.1	5.5	7.1
1951 (planned)	74.1	6.4	8.4	11.1

The large areas devoted to cereals and the very small areas devoted to fodder and industrial crops offer the best evidence of the backwardness of Yugoslav agriculture.

The predominant cereals grown are wheat, corn, barley, oats, and rice. Areas sown in wheat and corn are almost equal in size. In some years, however, corn has been sown in as much area as the total of all the other cereals (except wheat).

Although wheat is the most important bread grain, the wheat area in Yugoslavia is smaller than the corn area. Wheat is grown in almost all areas, but it grows best in the Vojvodina, Slavonia, Posavina, and Macva. The large albumin and gluten content of the wheat, particularly in the "bankut" variety, makes it one of the best in the world.

Of the total area sown to cereals before World War II, corn occupied about 43 percent. Although corn is grown throughout Yugoslavia, the best yields are in the wheat-growing area.

Of the total area sown to cereals before the war, barley occupied about 8 percent. Barley is grown throughout Yugoslavia, but in the mountainous areas of Serbia, Bosnia-Hercegovina, Montenegro, and Dalmatia it ranks first among the cereals since it serves as a food.

Oats occupy 6 percent of the total area sown in cereals. Oats grow in the mountainous areas as well as in the plains.

Before the war, rice was grown exclusively in Macedonia. In 1947 and 1948, rice areas were increased by 60 percent. During that period, rice growing was begun in Croatia and Serbia.

Notwithstanding favorable climatic and soil conditions for growing industrial crops, they occupied only one percent of the arable land in prewar Yugoslavia. However, Yugoslavia ranked among the first in Europe in variety of industrial crops grown. The quality of industrial crops was rather poor owing to inadequate technology and the lack of good-quality seeds. Cotton and other subtropical crops were sown in only 3.3 percent of the arable area in Macedonia, although conditions were favorable for increasing their area not only in Macedonia, but also in Hercegovina, Montenegro, and Dalmatia.

The industrial-crop area was increased in 1946 and 1947 by about 1.3 percent over that of 1939. The Five-Year Plan calls for the industrial-crop area to be increased 2.5 times (over that of 1939), which includes increasing the cotton area 6 times; sugar beet, 3.7 times; hemp, 2.6 times; sunflower, 7.7 times; soybeans, 15.5 times; and tobacco, 3.5 times.

Yugoslav industrial crops can be divided into textile oleaginous, sugar beet, and subtropical crops.

The most important plants in Yugoslavia for textile uses are hemp, flax, and cotton, the last-named being classified as a subtropical crop.

Among fibrous plants grown in prewar Yugoslavia, hemp was the most important. In 1939, there were 57,000 hectares sown in hemp. By 1948, the prewar hemp area had been exceeded. In 1949, it was planned to sow 100,000 hectares of hemp. Hemp is grown mainly in the Vojvodina and Slavonia.

Flax areas in 1939 totaled 14,800 hectares; in 1949, it was planned to sow 14,200 hectares of flax. During the war, flax suffered special damage. After the liberation, unfavorable weather conditions during the vegetation period had a bad effect on flax.

In 1939, the sunflower area included 19,000 hectares; in 1948, it included 120,000 hectares. Sunflowers are grown mostly in the Vojvodina, Slavonia, and Posavina.

Before the war, the soybean area was very small. In 1948, soybeans were sown in 9,100 hectares; in 1949, 20,050 hectares were to be sown. Soybeans are grown mainly in Bosnia, the Vojvodina, and Croatia.

The sugar-beet area in 1939 included 46,663 hectares. In 1948, 75,000 hectares were sown in sugar beets; in 1949, it was planned to sow 66,500 hectares. To stabilize (prevent fluctuations in quality) the sugar-beet industry, production of fine-grade and superior-grade seed was begun to produce sugar beets of an excellent quality, equal in yield and sugar content to the best foreign varieties. Sugar beets are grown mostly in the Vojvodina, Slavonia, and Posavina, but since the war they have been grown successfully in Slovenia.

Among Yugoslav plants that have industrial uses, hops occupy a very important place. They are grown mainly in the Vojvodina-Srem area and in Slovenia. In 1939 the hop area included 2,930 hectares. Since hop cultivation was nearly destroyed during the war, the growing of hops had to be reestablished. The hop area planned for 1949 was 1,570 hectares. In quantity of hops produced, Yugoslavia ranks fourth in Europe. Savinske hops are among the best-quality export varieties.

Castor beans are grown in Serbia, Macedonia, and Croatia. In 1939, the castor-bean area included 329 hectares. Although this culture suffered considerably during the war, because of excellent growing conditions and its importance, Yugoslavia began increasing the area devoted to castor beans. The area planned for 1949 totals 4,500 hectares.

The main subtropical crops grown in Yugoslavia are cotton, sesame, poppies, opium poppies, aniseed, and peanuts. Although conditions were excellent before the war for their cultivation, they were grown in only 3.3 percent of

the total arable area of Macedonia. Immediately after the liberation, measures were taken to intensify and expand their production in Macedonia, Montenegro, Bosnia-Hercegovina, and Croatia. A network of experimental fields growing individual varieties was established. In Macedonia, 13 percent of the total area was to be sown in subtropical crops in 1949.

The most important subtropical crop in Yugoslavia is cotton, and the largest area is sown in it. Before the war, cotton was grown exclusively in Macedonia. Immediately after the liberation, however, cotton growing was introduced into Bosnia-Hercegovina, Croatia, and Montenegro.

Although tobacco is not exclusively a subtropical plant, it is grown in Yugoslavia mostly in the subtropical area. Yugoslav tobacco is one of the best in the world. Hercegovinian and Macedonian tobaccos are particularly famous because of their aroma, light color, and large, fine, silky, and elastic leavers.

Probably no other country in the world has as favorable conditions and possibilities for the development of medicinal plants as Yugoslavia, because of the geological structure of the country and climatic conditions. In Yugoslavia, medicinal plants from Arctic flora to Mediterranean flora grow and thrive.

The most important medicinal plants which grow in Yugoslavia are: white mallow (Althaea officinalis), celery (Apium graveolens), caraway (Carum Carvi), great celandine (Chelidonium majus), ergot of rye (Claviceps purpurea), lavender (Lavandula officinalis), wild mallow (Malva silvestris), camomile (Matricaria Chamomilla), melissa (Melissa officinalis), peppermint (Mentha piperita), opium poppy (Papaver somniferum), primrose (Primula officinalis), lungwort (Pulmonaria officinalis), a medicinal bark (Rhamnus catmartica), hundred-leaved rose (Rosa centifolia), rosemary (Rosmarinus officinalis), sage (Salvia officinalis), black mustard (Sinapis nigra), dandelion (Taraxacum officinale), linden (Tilia parvifolia and Tilia platypholis), valerian (Valeriana officinalis), and violet (Viola odorata).

In prewar Yugoslavia, medicinal plants were of no particular importance to the national economy or to public health, because foreign chemical and pharmaceutical industries (mostly German) flooded Yugoslav markets with finished drugs.

After the liberation, Yugoslavia, realizing the importance of medicinal plants for domestic industrial processing and for export, undertook to expand the production of these plants. Medicinal plants are collected according to plan, buildings are being constructed for their collection and processing, and steps are being taken to improve their quality.

In prewar Yugoslavia, garden crops fluctuated greatly. In autumn the markets would be flooded with late vegetables, but there would be shortages in the winter and spring when vegetables would be scarce and too expensive for the general population. Average annual consumption of vegetables in Yugoslavia was slight. To meet the needs of the well-to-do classes, prewar Yugoslavia had to import vegetables despite favorable conditions for domestic production. Annual imports amounted to approximately 20 million dinars' worth of processed vegetables. Almost no attention was paid to the production of early vegetables. Of the total arable surface only 1.5 percent was in vegetables. During the war, hothouses and other facilities were worn out or destroyed, so that production decreased further.

After the war, realizing the importance of vegetables in the diet, the people's government immediately took measures to increase the output of garden crops. In 1951, the Five-Year Plan calls for a 151 percent increase in vegetable crop area over that of 1939 and for an increase in yield per hectare. In 1948, the increase in vegetable crop area totaled 130,000 hectares over 1939. By applying better farming methods, yields were increased per hectare. In addition, sufficient quantities of quality seeds necessary for fulfilling the sowing plan were provided. Considerable quantities of garden seeds were formerly imported, but domestic production of such seeds was begun after the war. In 1945 and 1946, an average of more than 200 car loads of seeds were imported annually whereas in 1949, only three to four boxcars of seeds were imported.

State farms, farm work cooperatives, cooperative farms, and agricultural farms of enterprises and establishments play an important role in supplying cities and the industrial population with vegetables.

The most important vegetables grown successfully in Yugoslavia are potatoes, beans, cabbage, onions, peppers, and tomatoes.

Before the war, potatoes were grown in a relatively small area. Since their nutritional value was not sufficiently known, their consumption was slight. In 1939, 258,488 hectares were sowed to potatoes. After the war, this area was increased to 360,000 hectares.

Beans have always been of primary importance in the Yugoslav diet, so they are grown extensively throughout the country. Before the war, beans were produced mainly to meet domestic requirements, and only small quantities were produced for export. The Five-Year Plan calls for considerable increases in acreage to be planted in beans.

Cabbage is also one of the most important foods in Yugoslavia, and the requirements of the population are met entirely by the present output.

Little attention was paid to fodder crops in prewar Yugoslavia. Immediately after the liberation, fodder-crop areas were increased by introducing crop rotation. In 1948, fodder-crop areas increased to 7.1 percent of the total arable area. The Five-Year Plan calls for fodder-crop areas to be increased to 11.1 percent of the arable area.

SCIENTIFIC FARMING METHODS

Scientific farming methods are receiving more and more attention in Yugoslavia. The fallowing of stubble fields, deep plowing, the rolling and harrowing of winter crops, the powdering of seeds, and the use of fertilizers are being introduced on a large scale. In the Vojvodina, scientific farming methods formerly used only by the rich farmers are now extensively applied by all farmers. In Macedonia, only spring plowing was done for spring crops; now, most land is plowed in autumn for the crops which will be sown the following spring. This practice helps conserve moisture, which is particularly important for Macedonia, where the rainfall is slight.

In comparison with 1946, production in 1947 increased in cereals, 71 percent; sugar beets, 117 percent; hemp, 127 percent; cotton, 2,624 percent; sunflowers, 110 percent; and potatoes, 105 percent. This increase resulted from favorable climatic conditions and large-scale application of modern scientific farming methods.

A seed service did not exist in prewar Yugoslavia, for the supplying of seeds was in the hands of five private commercial companies. Disorder in seed supplying was such that the same variety of seed was being simultaneously imported and exported, and certain varieties of seeds were being imported constantly although they could have been produced domestically.

The improvement of plant varieties and the production of quality seeds were also on a low level of development. The six state and one private selection stations could not achieve much, because their operations were divorced from current practice and unassisted by the state.

Because of lack of scientific research and lack of planning in plant varieties, there was a great diversity of plant varieties in individual crops, and regionalization of varieties was not even considered an important problem.

The seed-control service, which consisted of six laboratories, did not serve the interests of agricultural advancement but served the interests of seed wholesalers.

After the liberation, steps were taken to supply seeds to carry out the sowing plan; not much attention could be given to quality. Seeds for many plants, particularly industrial and garden plants, had to be imported, since production of them had declined during the war.

To insure adequate supplies of seeds, the Administration for Seed Service was established in the federal Ministry of Agriculture, and the establishment of seed enterprises under the republic ministries of agriculture was begun. By the beginning of 1946, the Federal Seed Center in Zemun had been established to import and export seeds. Seed centers also were established in several of the republics, which mainly purchased and distributed commercial seeds, but also organized seed production. Cooperatives and crop-purchase organs of the Ministry of Trade and Supply also engaged in supplying seeds.

With the introduction of the Five-Year Plan, the seed service began to produce seeds on a large scale. Agricultural research institutions also participated in this work, and a large number of new establishments were created. In the production of quality seeds, the seed service relied primarily on the state agricultural sector, which applied advanced scientific farming methods and had a technical staff. However, farm work cooperatives and other agricultural cooperatives gradually are being included in the production of seeds.

As the first step in the production of quality seeds, in some republics the use of approved seed and seedlings for cereals and potatoes was introduced in 1946, to assure quality seeds. The use of approved seed resulted in the following increases in production:

STAT

	1946		1947		1948	
	Carloads	Percent	Carloads	Percent	Carloads	Percent
Wheat	997	100	3,219	323	8,979	900
Rye	50	100	244	488	537	1,004
Barley	89	100	596	670	1,192	1,340
Oats	5	100	563	11,260	1,040	20,800
Potatoes	400	100	727	182	2,374	593
Total	1,541	100	5,349	347	14,122	916

Through approved seed and seedlings, a great number of varieties were eliminated and selective varieties were utilized which give greater and more reliable yields. The best approved seeds were given to state farms and to farm work cooperatives for further experimentation, while the remaining approved seeds were distributed to producers.

The production of farm crops was increased as follows:

	1946		1947		1948	
	Carloads	Percent	Carloads	Percent	Carloads	Percent
Industrial crops	155	100	773	500	1,656	1,068
Fodder crops	42	100	385	385	1,200	3,000
Vegetables	91	100	177	177	280	307

Owing to the development of domestic seed production, Yugoslavia needs no longer rely on the import of some seeds. In 1947 and 1948, sufficient hemp seeds were produced to fulfill the sowing plan. Beginning with 1949, Yugoslav selection stations for sugar beets were to produce quality and super-quality seeds with would meet domestic requirements; 25 percent of total requirements were produced in 1947 and nearly 50 percent in 1948. The production of sunflower seeds of domestic selection is also fully assured.

Yugoslav agricultural institutes and selection stations have been given planned tasks to cultivate new varieties and to improve existing ones. Several improved varieties of wheat already have been developed such as the new facultative U-1, U-14, and U-16 varieties with high yields. The Profilik variety has been improved to thrive in more humid areas and can now be grown farther north. Several new varieties of barley, oats, vetch, cowpeas, beans, flax, and soybeans have been improved; and two new varieties of sunflower have been developed. Work also has begun on the selection and creation of new varieties of potatoes.

Considerable success was achieved in the production of hybrid corn seed in 1947 - 1948. In 1947, hybrid corn seed was produced on state farms by cross-breeding the best-quality and most fertile varieties in 12 different combinations over an area of 7,000 hectares. In 1948, hybrid seed was produced over an area of 4,000 hectares.

Hybrid corn seed produced in 1947 was sown on over 150,000 hectares. Crops from hybrid corn seed produced a 10 to 15 percent higher yield than the varieties from which it had originated. Hybrid corn yields over 400 kilograms more than the varieties from which it was developed and it produces a higher percentage of grains per cob.

The seed service organizations has been expanded and strengthened to keep pace with the expansion and increase in its work. In 1947 - 1948, the republic Ministries of Agriculture established republic administrations for seed service and a large number of republic seed enterprises. In mid-1948, the seed service expanded to include the Srez Seed Service, consisting of srez seed enterprises and seed sections in srez cooperative associations. Ninety-nine srez seed enterprises and 226 seed sections were established.

According to a definite plan and on the scientific basis of Michurin's agricultural and biological science, institutes and selection stations will produce seeds of suitable quality by developing new and original varieties or by improving existing ones.

In 1949, state farms, farm work cooperatives, and other agricultural cooperatives will establish seed-growing plots where they will increase for their own needs quality seed received from seed sections.

Use of Fertilizers

The following shows the former [date not specified] consumption of fertilizer per hectare of arable land in Yugoslavia compared with that in other countries (in kilograms):

Switzerland	478.8
Denmark	209.9
Great Britain	206.8
Germany	173.6
Italy	144.1
France	105.1
Czechoslovakia	55.2
Austria	44.6
US	13.1
Hungary	7.59
Yugoslavia	3.52

Increasing use of artificial fertilizers in Yugoslavia is being accompanied by an ever-increasing consumption of stable manure. Thousands of hectares of "green fertilizer" are also being plowed under.

Since most of Yugoslavia has abundant rainfall, the soil is deficient in lime because of its being washed out of the top layers of soil. Although data are incomplete, it is assumed that 50 percent of Yugoslav soil is acidic and 30 percent less acidic, so that all these soils require lime to increase their fertility.

Prior to 1941, liming the soil was considered an important scientific farming measure but was applied by only a few agriculturists and experts. The state did nothing to make this measure widespread. In 1947 and 1948, experiments in the use of lime in the republics, particularly in Slovenia and Serbia, prepared the way for large-scale use of lime to fertilize the soil. By organizing tens of thousands of field demonstrations, establishing specific enterprises for the exploitation of lime, and utilizing local deposits of suitable limes, liming the soil is to be made even more widespread.

Fruit Growing

Fruit growing in Yugoslavia does not compare in area, production, or quality with that of other countries. Fruit growing still occupies a negligible place in the Yugoslav economy, though climate and soil conditions are favorable.

The Five-Year Plan calls for the number of fruit trees to be increased in 1951 as follows (compared with previous years):

	1920	1939	1946	1951
Apples	6,470,000	8,111,000	7,123,000	9,600,000
Pears	3,726,000	4,622,000	3,174,000	4,300,000
Plums	56,825,000	44,600,000	36,901,000	40,000,000
Walnuts	1,361,000	2,778,000	1,808,000	2,600,000
Olives	3,233,000	4,689,000	4,536,000	5,000,000
Other fruits	4,432,000	9,617,000	8,106,000	11,200,000
Total	76,047,000	74,417,000	61,648,000	72,700,000

The distribution by republics is to be as follows (compared with previous years):

	1920	1939	1946	1951
Serbia	41,300,000	39,306,000	32,555,000	38,700,000
Croatia	14,700,000	13,452,000	12,026,000	13,452,000
Slovenia	4,700,000	4,756,000	4,518,000	5,132,000
Bosnia-Hercegovina	14,037,000	14,243,000	9,802,000	11,861,000
Macedonia	800,000	1,370,000	1,530,000	1,711,000
Montenegro	510,000	1,290,000	1,217,000	1,844,000
Total	76,047,000	74,417,000	61,648,000	72,700,000

Owing to very favorable natural conditions for growth, fruit yields were not too low even before the war, but prices were so consistently low that fruit growers did not find it profitable to develop better fruit trees. Since

markets were not organized properly, consumer centers were not adequately supplied with fruit. In good years, even though fruit normally was abundant, it was usually of poor quality and not utilized to the best advantage. The fruit season was very short, resulting in fruit shortages so that high-priced foreign fruits had to be imported.

Industrial processing of fruits was not developed, being confined generally to production of whisky, jam, or dried prunes. Producers did not profit much from processing, since profits were limited because of the need to purchase fresh fruit and fruit preserves (from abroad).

Since the liberation, steps are being taken to plant large planned orchards of fruit trees in areas best suited for specific fruit and to utilize hilly ground which is unsuitable for farm crops but is favorable for growing fruit. Land has been divided into fruit-production areas, each area being assigned the kind of fruit and the varieties best suited to it. Consequently, a large main plum-production area, two main apple-production areas, and several secondary apple-production areas have been established. In all, six areas of federal importance, 12 areas of republic importance, and three areas of local importance have been established.

In the main fruit-production areas of federal importance, fruit production is to develop in both the state and cooperative sectors. Tens and hundreds of new orchards of fruit seedlings are to be intensively cultivated. To establish these orchards, fruit nurseries are being put in order and expanded, where good-quality fruit seedlings are being cultivated in varieties best suited to Yugoslav fruit areas.

Yugoslavia has several hundred large and small state nurseries. New fruit institutes are being established to study fruit-growing problems, such as methods of cultivation, varieties, and introduction of new technological methods.

The Five-Year Plan calls for a restoration to the prewar level of orchards destroyed during the war, increasing the yield per tree by the application of scientific methods, and increasing the production of fruit-tree seedlings 2.5 times over prewar production.

The plum is Yugoslavia's most important fruit. Two thirds of the plum orchards are in the plum-growing areas, which stretch from the Kozara Mountains across the Majevica Mountains, the Serbian Pogorina area, and Rudnik Mountain, to the Velika Morava River.

The Pozega /place name/ variety is predominant. This variety has different names in different areas: Bistrica /place name/, Domaca (domestic), Cesplja, Sina, Madjarka /Hungarian/, Citlovka, Modrusa /Modrus, place name/, and Cepaca /Cepak, place name/. Seventy five percent of the total annual production, which amounts to 50,000 carloads, is in the Pozega variety. It is mostly used for home processing and for making whisky. A total of 2,000-5,000 carloads of fresh plums, 2,000-5,000 carloads of dried prunes, and about 300 carloads of plum jam are exported. Other well-known plum varieties are the Ranka or Darosavka /Darosava, place name/, the Drenovaca or Trnovaca /Trnovac, place name/, and the Moravka /Morava, place name/ or Bugarka /Bulgarian/, which are used for making whisky. They are of poor quality but bear regularly and in great quantities. Other well-known varieties are the talijanka /Italian/, the Dinjka and Renklode varieties, and the Dobojska /Doboj, place name/.

Northeastern Slovenia produces most of Yugoslavia's apples. High-quality varieties are grown, including the Kanadska Reneta /Canadian variety of some kind/, Boskopka Zlatna Parmenka /Golden variety of some kind/, Jonathan, and others. Another apple-growing area is the basin of the Zapadna Morava River, where the Budimka /Budim, place name/ variety used to be predominant, but where other quality varieties are now being planted, including the Boskopka, Jonathan, Kanadka, Parmenka, and others. Prespa is also well-known for its apples, and a modern method of fruit production has been introduced there. Conditions are favorable for apple growing in Polog, Polimlje in the Sandzak, Toplica in Serbia, Levac in Serbia, the Croatian Zagorje, Doboj, and Prijedor in Bosnia.

Although Yugoslavia has about 4 million pear trees, markets are inadequately supplied with pears, becuse most of the fruit grown is of poor quality, suitable mostly for wine. The best-known varieties are the Tiranka, Takisa, Lerinka, and others. Improved varieties include the Kaludjerka, which thrives even under relatively poor cultivation. Other improved varieties have spread considerably, such as the Dilova, Maslavka, Boskova Bocica, Vilijamovka /William? /, Klerzo, Zimska Dekanka /winter variety of some kind/, Kongresovka /Congress/, Klapova, and others. Good pears are most abundant in Prespa in Macedonia, in Doboj in Bosnia, in Sumadija, and in the Zagreb and Fruska Gora areas.

The annual production of olive oil averages up to 50,000 hectoliters. More and more attention is being given to the growing of olives, and the number of varieties is being selectively reduced.

VINICULTURE

Yugoslav climatic and geographic conditions are excellent for the growing of grapevines. Grapevines are grown in Macedonia, Slovenia, in the east (Timocka Krajina, Vrsac, Bela Crkva), and in Istria, the Croatian Primorje, and Dalmatia.

The economic importance of viniculture is reflected in both internal and foreign trade. In the foreign trade of prewar Yugoslavia, grapes and fruit constituted about 15 percent of the total value of all exports of farm crops, although only 3.5 percent of the agricultural area under cultivation was devoted to grape and fruit growing.

From the agricultural point of view, the importance of viniculture lies in the fact that soils and terrain which cannot be used economically for other agricultural crops can be used for cultivating grapevines. Such soils and terrain include steep slopes of hills and mountains; very sandy, gravelly, or rocky soil; soil containing large quantities of lime; soil poor in nutrition; and soil exposed to erosion, drought, and the like. Yugoslavia has a good deal of such terrain and such soils.

In 1939 in prewar Yugoslavia, there were 222,432 hectares of vineyards, constituting 2 percent of the total agricultural area. The distribution of prewar vineyards in the areas constituting the present republics was as follows (in hectares):

	Grafted Vines	Ungrafted Vines	Hybrid Vines	Total
Serbia	74,853	13,183	6,810	94,846
Croatia	73,278	5,076	8,194	86,553
Slovenia	25,370	199	2,019	27,583
Bosnia-Hercegovina	2,465	1,202	193	3,860
Macedonia	2,615	5,828	2	8,445
Montenegro	142	972	31	1,145
Total	178,723	26,460	17,249	222,432

Viniculture in prewar Yugoslavia developed on an individual and elementary level. For instance, after an attack of phylloxera, restoration of vineyards was generally left to the vinegrowers themselves. State organs gave little attention to proper development and advancement of viniculture. There were about 142 hectares of grapevine-seedling area distributed among more than 50 nurseries in various parts of the country. Their production, which was about 10 million cuttings annually, made possible the production of 5-6 million vine grafts, sufficient to restore worn-out vineyards or to raise new ones on an area of only 600-700 hectares annually. Such an output was far from meeting needs, so vineyards were raised directly from hybrids and from non-grafted vines, even where phylloxera had already appeared, and also in areas where these vines could not flourish.

The processing of grapes and the production of wine were generally on an individual basis. According to incomplete data, there was equipment for producing about 7,430 carloads of wine. Of that capacity, about 2,840 carloads were produced by the cooperative sector. The rest was in the hands of dealers who bought grapes and produced wine, or bought and traded in wine already produced. Accordingly, large cellars produced only a little more than 10 percent of the total wine produced in Yugoslavia. The cooperative sector pocessed scarcely 4-5 percent of grapes processed; 90 percent of grape processing and wine production was done by vinegrowers. Immense quantities of wine were spoiled, since they did not have sufficient technical knowledge; or adequate installations, machinery, equipment, tools, space; or cellars for processing and wine making. The bulk of Yugoslav wine could not be stored even for a year, but would spoil in the spring.

The total vineyard area in Yugoslavia amounts to about 244,150 hectares, distributed as follows (in hectares):

Serbia	112,560
Croatia	93,320
Slovenia	22,800
Bosnia-Hercegovina	3,340
Macedonia	11,300
Montenegro	830

Considerable vineyard areas are exhausted because of old age. The average life of grapevines in Yugoslavia is estimated to be 25-30 years.

The Five-Year Plan calls for increasing the vineyard area by 105 percent over that of 1939, increasing the production of grapes by 140 percent, increasing wine production by 126 percent, and increasing vine nurseries by 890 percent. The Five-Year Plan calls for the consturction of large new wine cellars with a total capacity of about 25 percent of the total wine production of Yugoslavia. Some of these cellars already are under construction.

By the end of 1947, grapevine-nursery areas already totaled more than 25 percent of the area called for by the Five-Year Plan. At the end of 1949, these areas were expected to total more than 52 percent of the areas planned. Yugoslav viniculture has been divided into the following vinicultural zones:

Serbia	Timok-Krajina	14,000
	Nis-Juzna Morava (Nis-Southern Morava)	17,500
	Zapadna Morava (Western Morava)	22,000
	Sumadija-Podunavci	25,000
	Fruska Gora	11,500
	Banat-Backa	16,500
	Kosmet	3,100
Croatia	Severni Jadran (Northern Adriatic)	13,500
	Dalmatia	35,500
	Severnozapadna Hrvatska (Northwest Croatia)	29,500
	Severnoistocna Hrvatska (Northeast Croatia)	8,500
	Podunavlje	5,500
Slovenia	Drava	10,000
	Posava	8,700
	Primorje	3,000
Bosnia-Hercegovina	Mostar-Neretva	2,000
Macedonia	Vardar	6,100
	Zapadna Makedonia (Western Macedonia)	4,000
	Istocna Makedonija (Eastern Macedonia)	1,100
Montenegro	Montenegrin Primorje	1,000

The more important varieties of grapes are grown in the following areas: Smederevka: Smederveka, Sasle, Afusa, Hamburg Muscat, and others of less importance; Vencac: Prokupac /Prokuplje, place name/, Sovinjon, Riesling, Smederevka, Tamnjanika /Tamjanica, place name/, Malaga, and others; Zupa: Prokupac and to a lesser extent Sovinjon, Semion, Riesling, Burgundy, and Hamburg Muscat; Nis-Pirot: Prokupac and Plovdina; Krajina: Skadarka /Skadar, place name/, Bagrina /Bagri, place name/, Sovinjon, Reisling, Prokupac, Dark Burgundy, and others, including many hybrids; Vlastinac-Leskovac, Vranje, and Toplica: Prokupac and Plovdina, and some Lisicina and various Beline /white grapes/.

Leskovac, Jelika, and Pocersko: widely assorted varieties, with Prokupac, Plovdina, and Smederevka prevailing; Timok: Prokupac, Skadarka, and Plovdina; Fruska Gora, Subotica-Horgos, Vrsac-Bela Crkva, and Deliblatska Pescara: Slankamenka /Slankamen, place name/, Dinka, Dreaca, Skadarka, Portuguese, Frankovka, Capicki Biser, Malinger, Sasle, Tamnjanika, and Hamburg Muscat; Prizren-Orahovac-Metohija: the leading variety is Prokupac.

The uplands of Croatia: mostly the Kraljevina, Zelenika /Zelenik, place name/, Lipovina, Ruzica, Moslavac, and Volovina for ordinary wines; Riesling, white and light Burgundy, Sovinjon, Silvanac and Traminac for quality white wines; dark Burgundy, Kabernc, Frankovka, Portuguese, Kadarka, Branicevka /Branicevo, place name/, Kosovina, and Mukovatka for red wines; Croatian Primorje: Zlahtina, Malvasija, Plavac Zuti /dark purple/, Zumic, and Vrbia; Sibenik-Split, Biograd, the southern islands, Dubrovacko-Konavljansko, and Imotsko: Mainly Mali Plavac /small purple/, Plavina, Nincusa, Dobricic, Ljutun, Vrbanac, Kadarun, Blavina, Lasina, Marastina, Trbljan, Bogdanusa, Vugava, Tina, and Zilavka; table varieties include the Malaga, Pagadebit, Ranac /early/, Small Muscat, and some others of less importance.

Istria: Malvasija, Trbljan, Barbera, Refosk, Teran, Marzelin /Marsala/, and others; Slovenia: White Burgundy, Rhine Riesling, Silvanac, Zeleni, Italian Riesling, Modra Frankinja, Traminac Crveni, Rulandec, Sovinjon, and Kraljevina; Bosnia-Hercegovina: Zilavka, Krkosija, Bena, Rezaklija, Pegavac, Zlozder, Blatina, Skadarka, Nincusa, Plavka, Bratkovina, some Rieslings, and some Semijons; Macedonia: Stanusina, Prokupac, and Plovdina lead, while Smederevka, Hamburg Muscat, Afus-Ali, and various Sasle are becoming more widespread; and Montenegro: Vranac, Krkosija, Zadrinka, Krstac, Milicina, Kratosija, and Belina.

Plant Protection

Plant diseases and parasites, which damage agricultural crops greatly every year, include: in fruit growing -- the California blight, the plum curculio, fruit fungus, the yellow, the fruit fly, the apple worm, plum fire blight, and the fruit blight; in farm crops -- locusts, ground squirrels, field mice, sugar-beet disease, blights, rusts, smuts, and others; in viniculture -- the grape moth, fire blight, grape scale, and others. During the occupation, the Colorado potato beetle was brought into Yugoslavia.

Annual losses from these diseases, insects, and animals are estimated at several billion dinars. From 1928 to 1932, the plum curculio affected about 15 million plum trees, inflicting damage totaling 7.5 billion dinars. Locusts regularly damage 10 million dinars' worth fo crops annually. In 1948, a mass invasion of caterpillars in Serbia inflicted damage totaling 500 million dinars on forests and fruit.

In prewar Yugoslavia, the protection of agricultural crops from plant diseases and harmful insects and animals did not receive serious attention, except in agricultural experiment and control stations where plant protection departments were established to do part-time work of this kind. The suppression of plant diseases and harmful insects and animals was left largely to the farmers.

Since the liberation, much attention has been paid to the protection of agricultural crops. A separate service for plant protection is being organized and a technical staff trained. Measures for the suppression of harmful

insects, animals, and diseases are planned on a mass basis under competent leadership. Hundreds of thousands of farmers have participated as follows: In 1947, 3,779,500 trees were treated for plum curculio; in 1948, 6,608,687 trees, with the state assisting with 6,687,500 dinars and 7,610,640 dinars, respectively. In 1947, 27,950,000 fruit trees were sprayed, and 26,444,832 fruit trees were sprayed in 1948. In 1947, locusts were eliminated from an area of 25,000 hectares. Considerable quantities of chemicals produced by the Yugoslav chemical industry were utilized.

AGRICULTURAL PERSONNEL

One of the most important reasons for the backwardness of prewar Yugoslav agriculture was extreme negligence in the training of /farm/? personnel. Per 10,000 hectares of agricultural area in 1939, there was only 1.1 agriculturist with faculty training and 1.3 with secondary training. In 1938 - 1939, there were only 2 agricultural faculties, 2 veterinary faculties, 3 secondary agricultural schools, and 28 lower (including householders') schools. In them, 1,875 students in faculties and 2,657 secondary school students received instruction. These schools, institutes, and establishments were very poorly equipped.

War devastation further decreased the number of trained personnel, so that in 1945, Yugoslavia had only about 1,100 agronomists and 1,400 technicians, but only 950 agronomists and 850 technicians actually worked in the agricultural sector.

The Five-Year Plan calls for an additional 3,000 agronomists, 800 veterinarians, 4,400 secondary-school agricultural technicians, and 28,000 regular personnel (11,200 to be trained in schools and the rest through courses). Three additional agricultural faculties, 44 secondary schools (technicums), and 36 one-year agricultural schools have been opened. The number of students in agricultural faculties has increased from 1,166 in 1938 - 1939 to 4,475 in 1948 - 1949; the number of veterinary faculty students, from 708 to 2,139; agricultural and veterinary secondary school students, from 501 to 5,745; and one-year agricultural school students, from 2,156 to 3,124. Much attention is also being paid to training through courses; 8,600 persons took agricultural courses in 1947; 28,300 in 1948; and the 1949 plan called for 43,500 to take courses.

Before the war, only a small number of students could be educated in schools because of lack of finances. Today, the school system enables all agricultural workers to educate themselves to university level. The large number of scholarships has eliminated financial difficulties /for agricultural workers seeking an education/ The federal Ministry of Agriculture grants about 20,000,000 dinars in scholarships annually.

AGRICULTURAL RESEARCH INSTITUTIONS

In prewar Yugoslavia, there were 11 research establishments for farm crops, 2 for fruit growing, 6 for viniculture and fruit growing, 13 for livestock raising, and 2 for machinery. The most important scientific research institutes were the state agricultural experimental and control stations.

About 125 professional workers with university and secondary-school education were employed in these establishments, or an average of four experts and technicians per establishment. Since about 50 percent of the personnel mentioned were employed in the establishments, in Belgrade, Zagreb, or Split, most of these establishments were establishments in name only. They were not well-supplied or well-equipped. Except for the work of a few experts, their work was unsystematic.

Agricultural research establishments in Yugoslavia now include the following:

Federal Establishments

1. Federal Institute for the Production and Improvement of Plants in Zemun, which consists of the Federal Station for Selections of Sugar Beets in Crvenka, Federal Station for Selection of Plants in Osijek, Federal Station for Selection of Plants in Brestovac and Belje, and Federal Station for Selection and Production of Plants in Coka.

2. Federal Institute for the Mechanization of Agriculture in Belgrade.

3. Federal Institute for Livestock Raising and the Bureau for Sheep Raising in Belgrade.

4. Federal Institute for the Protection of Plants in Zemun.

5. Federal Institute for Adriatic Crops in Split.

6. Federal Institute for Economics.

Republic Establishments

Serbia

1. The Republic Institute for Agricultural Research in Topcider and Kragujevac, which includes the Bureau of Pedology in Topcider, Bureau of Agro-Chemistry in Topcider, Bureau of Farm Crops in Kragujevac, Bureau of Plant Protection in Kragujevac, Bureau of Viniculture and Wine Making in Topcider, and Bureau of Livestock Raising in Topcider.

2. Bureau of Agricultural Research in Krusevac.

3. Bureau for Improvement of Sugar Beets and Vegetables in Aleksinac.

4. Zonal Experimental Agricultural Station in Zajecar.

5. Sub-Zonal Experimental Agricultural Station in Smederevska Palanka.

6. Bureau for Fruit Growing and Fruit Processing in Cacak.

7. Bureau for Viniculture and Fruit Growing in Svetozarevo.

8. Oenology Station in Bukova.

9. Oenology Station in Vrsac.

10. Provincial Bureau for Agricultural Research in Novi Sad, including departments in agrochemistry, production and improvement of plants, plant protection, testing of quality of wheat, agricultural control, and gardening.

11. Provincial Bureau for Fruit Growing, Viniculture, and Agriculture in Sremski Karlovci.

12. Station for Selection of Peppers in Horgos.

13. Central Metohija Reclamation Station in Pec.

Cro tia

The Administration for Scientific Research in Zagreb, which consists of the following:

1. Station for Land Tillage in Zagreb.

2. Station for Plant Protection in Zagreb.

3. Station for Agricultural Ecology in Zagreb.

4. Station for Livestock Raising in Novi Dvori.

5. Station for Fruit Growing, Viniculture, and Wine Making in Zagreb.

6. Station for Agricultural Economics in Zagreb.

7. Station for Fruit Growing in Saulovac.

8. Station for Selection of Potatoes in Stara Susica.

Slovenia

The Agricultural Scientific Bureau in Ljubljana, which consists of the following:

1. Institute for Agricultural Economics in Ljubljana.

2. Institute for Production of Plants in Ljubljana.

3. Institute for Poultry Raising in Maribor.

4. Institute for Plant Protection in Ljubljana.

5. Institute for Agricultural Chemistry in Ljubljana.

6. Institute for Viniculture in Maribor.

7. Institute for Fruit Growing in Maribor.

8. Institute for Mechanization.

9. Dairy Institute in Kranj.

Bosnia-Hercegovina

1. The Agricultural Research Bureau in Sarajevo, which has a pedology section, an agricultural section, a fodder section, a phytopathology section, and a section for fruit growing.

2. The Agricultural Bureau in Mostar, which has an agricultural botany section, a combined section for viniculture and fruit growing, and a separate section for fruit growing.

3. Republic Station for Sheep Raising in Travnik.

4. Republic Station for Livestock Raising in Gacko.

5. Republic Station for Poultry Raising in Visoko.

6. Republic Station for Fruit Growing in Gorazde.

7. Republic Station for Fruit Growing and Viniculture in Lastva.

Macedonia

1. The Agricultural Research Institute in Skoplje, which has an agricultural technology and pedology section, a section for cereals and vegetables, an industrial plants section, a fodder section, and a gardening section.

2. Institute for Livestock Raising in Skoplje.

3. Sheep Selection Station in Sveti Nikola.

Montenegro

1. Republic Bureau for Agricultural Research in Titograd.

2. Southern Crops Bureau in Bar.

3. Livestock Raising Bureau in Niksic.

Although about 90 percent of Yugoslavia's scientific research establishments were completely destroyed during World War II and the professional staff was reduced considerably in the postwar period, nine new federal institutes and special stations and 43 republic scientific research institutes and provincial institutes and stations were established. Each republic has one or more agricultural research institutes and an extensive network of field experimental stations. In addition, a large number of zonal stations were established.

Not counting technical personnel, about 350 professional workers, mostly graduate agronomists, are employed in these establishments. The material resources of these new establishments are about 20 times greater than prewar resources.

To unify and conduct research, administrations for scientific research have been established in both the federal and the republic Ministries of Agriculture.

Yugoslavia has made extensive strides in the following: production of hybrid corn seed, collective regional experiments with individual plants, pedologic research and the mapping of land in individual areas, regional studies of and regionalization of plants, expansion of cotton and other subtropical crops, climatological and zonal studies, a consistent plan for

plant selection, introduction of new plants, improvement of agricultural production by reclamation, improvement of farming methods, large-scale application and preparation of agricultural instructions, introduction of new crop-rotation systems, measures against drought and plant parasites, the artificial insemination of sheep, and supplementary pollination.

LIVESTOCK RAISING

Livestock raising in Yugoslavia occupies a very important place in the national economy and represents one of the basic branches in agricultural production. Natural condition, climate, and possibilities for production of fodder are favorable for raising all types of livestock, including horses, cattle, sheep, goats, pigs, poultry, and rabbits. Apiculture and fishing are also well developed.

Sheep raising is the main branch of livestock raising in mountainous areas because of the presence there of extensive pastures on which large flocks of sheep can be raised. Horses, cattle, pigs, and poultry are mostly raised in the low, wheat-growing areas, where quantities of bulk and cereal fodder can be grown.

In prewar Yugoslavia, exploitation of villages by capital and the capitalist state government did not permit livestock raising to develop in quality or numbers. Livestock and livestock products were sold at very low prices, whereas almost nothing was invested in their qualitative improvement. Livestock production in Yugoslavia compared with other countries as follows:

	Germany	Austria	Denmark	France	Hungary	Italy	England	Switzer-land	Czecho-slovakia	USA	Yugo-slavia
Percent of culti-vable land under fodder plants	19.5	19.7	42	27.7	15	18.6	36	64	20	21.9	4.7
Number of horses (in thousands)	3,430	261	552	2,742	798	796	859	139	704	11,445	1,273
Number of horses per hectare of cultivable land	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2
Number of cattle (in thousands)	20,469	2,348	3,084	15,755	1,750	7,286	6,761	1,568	4,596	66,448	4,225
Number of cattle per hectare of cultivable land	1.22	1.45	1.16	0.7	0.3	0.6	1.9	3.1	0.8	0.5	0.6
Number of cattle per hectare of fodder plants	5.4	6	2.8	2.7	2.1	3	5.2	4.8	3.9	2.2	11.7
Number of cattle per hectare of meadows and pas-tures	2.4	1	7	14	1.1	1.3	0.8	0.9	2	--	0.7
Number of sheep (in thousands)	4,684	263	187	9,994	1,484	9,095	13,740	175	592	52,588	10,153
Number of sheep per hectare of meadows and pas-tures	0.54	0.11	0.42	0.86	0.91	1.56	1.6	0.1	0.25	--	1.64

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Number of pigs (in thousands)	23,805	2,823	3,066	1,117	2,624	2,814	3,940	876	3,900	42,948	3,504
Number of pigs per Hectare of cultivable land	1.22	1.45	1.16	0.33	0.46	0.21	1.1	1.74	0.66	0.31	0.46

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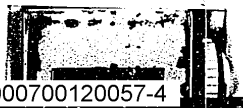

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However, cattle raising by richer farmers in some parts of Croatia and Serbia had achieved a high level, being developed through the import of the Siementhal breed. Great progress was also discernible in pig and horse raising.

Scarcely any state establishments for the production of good breeding stock existed except for a few horse-breeding farms and stud stations. In the field, there were several cooperatives or cooperative associations, which were organized for better utilization of state aid or to facilitate the sale of their livestock and livestock products, but they had no influence on livestock raising as a whole.

Livestock raising in prewar Yugoslavia was not more productive, because it was not proportional to productive capacities and agricultural area, it was not of sufficiently good quality, and it did not keep pace with the development of other branches of agricultural production or with the growth of the need for livestock products. Consumption of meat, milk, and eggs was lower than in most European countries. Livestock and livestock products were significant exports, however, because generally the Yugoslav working people could not afford to purchase them.

The following measures are being taken to increase the number of livestock and improve their quality:

1. Establishing stock-breeding stations on state farms to produce quality breeding stock of all kinds; a number of stock-breeding stations have been established for the raising of cattle, pigs, sheep, poultry, and rabbits. These stations are collecting the best breeding stock from breeds which have the highest productive qualities.

2. Establishing horse-breeding farms and stud stations to produce good breeding stallions from the best blood lines which are to be distributed to state farms and cooperative organizations for further breeding.

3. Establishing [seminal-fluid] receiving stations for male breeding animals from stock-breeding stations, stud farms, stud stations, cooperative organizations, and from abroad.

4. Establishing stock farms in the state and cooperative sectors to produce on a large scale quality breeding stock and good livestock products by applying modern scientific methods; this is especially important in mountainous areas where farms for the breeding of sheep and cattle are being established to make use of the large areas of mountainous pastures.

5. Organizing the production of good breeding stock in the state and cooperative sectors which are to serve as the main centers for quality livestock raising and livestock production.

6. Importing breeding stock to foster more rapid improvement in quality and productivity of livestock.

7. Applying modern scientific methods in stock farming, such as artificial insemination.

8. Assuring and fostering fodder supplies by reclamation of pastures and meadows, introduction of new fodder plants, maximal utilization of industrial waste useful for fodder, and the establishment of factories for the production of concentrated livestock feed.

9. Establishing better conditions for livestock care by building hygienic stables, pigsties, poultry houses, and stock enclosures in the state and cooperative sectors.

10. Setting up an extensive network of veterinary stations and veterinary services, and extensive production of veterinary vaccines and drugs.

11. Training a large number of specialist livestock and veterinary personnel by means of specialized lower, secondary, and advanced agricultural, livestock, and veterinary schools, and by means of periodic courses.

Livestock in Yugoslavia are distributed as follows:

Livestock in Yugoslavia (Thousand head)

		Total	Serbia	Croatia	Slovenia	Bosnia-Hercegovina	Macedonia	Montenegro
Horses	1939	1,278.5	501.4	333.1	56.5	265.8	92	31.7
	1945	766.1	289.9	240.9	56.6	104.7	62	12
	1946	897.3	363.9	265.6	60.6	124.4	71	13.8
	1947	973.3	388.3	306.9	59.8	130.4	74	15.9
	1948	1,050.8	402.2	312.8	61.9	172.9	82.4	18.6
Mules	1939	20.7	0.4	11.2	0.3	0.7	6	2.1
	1945	27.2	2.3	10.1	1.4	2.6	9	1.8
	1946	29.7	2.3	10.7	1.6	2.2	11	1.9
	1947	29.9	1.8	12	1.2	1.7	11	2.2
	1948	34.2	2.6	12.7	1.1	2.7	12.7	2.4
Donkeys	1939	132.3	9.9	48	0.5	7.5	59	7.1
	1945	110.8	10.6	37.6	0.8	6.6	40	6.2
	1946	128.2	11.6	40.8	0.6	8.1	60	7.1
	1947	136.6	11.5	47.2	0.4	8.5	61	8
	1948	161.2	14.6	53.7	0.4	10.7	72.2	9.6
Cattle	1939	4.332.4	1,420.7	1,001.9	442.6	967.1	326	174.1
	1945	3,494.1	1,414.5	721.9	418.6	545.3	294	99.8

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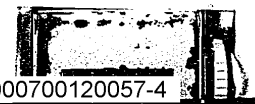

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	1946	3,928.6	1,599.8	766.3	421.4	676.7	342	122.4
	1947	4,246	1,616.1	914.2	429.9	757.2	349	179.6
	1948	5,259.9	1,959.1	1,061.7	490.7	1,144.1	409.2	195.1
Buffalo	1939	38.3	22.2	--	--	0.1	16	--
	1945	56.5	31.1	--	--	0.4	25	--
	1946	59.5	32.2	--	--	0.3	27	--
	1947	60	31.9	--	--	1.1	27	--
	1948	78.3	47.1	--	--	0.4	30.8	--
Sheep	1939	10,281.9	4,438.2	1,490.1	44.6	1,948.6	1,691	669.4
	1945	7,045.7	3,077.7	799.1	66.5	722.7	1,281	298.7
	1946	9,192.4	4,842.5	934.5	87.5	1,152.5	1,814	361.4
	1947	9,970	4,974.2	1,355.3	76.2	1,330.3	1,572	662
	1948	10,603.6	5,117.4	1,079.1	35.3	1,838.3	2,011	522.5
Goats	1939	1,885.8	529	171.6	15.6	475.9	515	178.7
	1945	1,450.2	539.2	160.9	18.3	200.8	408	125
	1946	1,827.6	654.4	190.3	18.7	297.7	517	149.5
	1947	1,828.1	658.2	237.6	20	363.8	282	266.5
	1948	1,306.1	741.4	153.4	24.7	249.3	47.1	90.2

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Pigs	1939	3,564	1,856.7	805.1	342.2	416	106	38
	1945	2,639.8	1,470.3	544.4	348.9	177.2	78	21
	1946	3,485.1	1,92[illegible]	705	452.6	295.8	78	25.8
	1947	3,439 1	1,827.7	903.8	366.4	229.2	66	46
	1948	4,128.1	2,332.9	1,019.5	429	296.3	120	30.4

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Horse Raising

Horses are extensively utilized in almost all branches of the Yugoslav economy, including transportation, agricultural production, and the army. Most horses in Yugoslavia are domestic breeds, called the Bosnian mountain horse, followed by domestic Lipizzan, Arab, and Ponius breeds. Other breeds imported during recent decades include the Belgian, the English Thoroughbred, various types of English half breeds, and the American Trotter.

The Bosnian mountain horse, which generally serves as a pack animal or saddle horse, requires little feed, is resistant to rigorous climatic conditions, and needs little care or lodging. It is good material for producing a horse for hauling loads in harness.

Because it is well-suited for agriculture, the Lipizzan breed is widely used in the mountainous areas of Croatia and in parts of Bosnia-Hercegovina and Serbia. Not requiring much feed, possessing resistance, endurance, and sufficient strength, it is the most suitable breed for all sorts of work, including draying, land cultivation, and riding.

Because it is well-suited for agriculture and adapts well to feeding conditions, the Ponius breed is very important. It is raised in the low wheat-growing areas, where it is well-suited for work in intensive agricultural production.

Somewhat weaker but well-adapted is the English half breed of the Furioso-North Star strain, and in more recent times of the Hanover and Traken lines, which meets the requirements of agriculture and, particularly, of the army. This half breed is raised to a small extent in the area where warm-blooded horses are raised.

The Arab breed is not raised as a thoroughbred in Yugoslavia but serves to improve domestic breeds. This breed has been raised mainly on state stud farms.

In recent decades, the Belgian breed of the Arend strain has become widespread in the northern parts of Croatia and Slovenia, because intensified agricultural production on small farms requires a strong horse which matures early and which has a good market early and which has a good market value. Since feeding conditions and care in these areas are not similar to those in the country of origin, however, it has not been possible to raise this breed with the qualities that characterize it.

The English Thoroughbred has not been important in Yugoslav horse raising, because it has been raised mostly for sports purposes Because of unplanned breeding, the raising of this horse has not attained the level which would make possible creating a half-breed type for domestic use.

The American Trotter is utilized exclusively for sports, except in a small area in Slovenia, where it is raised for agricultural purposes. In the further development of horse raising in Yugoslavia, this breed is of no agricultural importance.

See figure 3 for distribution of horses in Yugoslavia.

CATTLE RAISING

Although Yugoslavia has rich pastures, good meadows, fertile arable land, and a traditional love for animal husbandry, it still ranks among the last in Europe in cattle raising.

Domestic breeds of cattle prevail in Yugoslavia, with the Busa ranking first, then the Kolubara /place name/ and Podolje /place name/ cows, which are gradually being replaced by better breeds. The extensive distribution of the Busa breed is primarily due attributable to its adaptability to climatic and living conditions and its resistance to contagious and other diseases. This breed practically takes care of itself. It is small, weighs an average of 200 kilograms, yields an average of about 700 liters of milk annually, has a short lactation period, furnishes a poor quality of meat, and has negligible working capability. However, certain types of the Busa, such as the Red Metohija, the Polimsko, and others have a high milk yield, with their milk containing a high percentage of butter fat, and have a heavier body weight. Breeding the Busa with congeneric breeds has produced good results, such as the Gatacko breed. The Busa is a valuable breed for the further improvement of Yugoslav cattle raising.

Higher-bred cattle with productive qualities, which include the Siementhal, the Swiss, and the Pinzgau, have gradually replaced domestic breeds in areas where land tillage has been better developed and where conditions were favorable for their development. However, this replacement has been slow and without plan. Such breeds, formerly kept by rich farmers and large landowners who were able to provide better feed and care, have shown a great aptitude for acclimatization and adaptation to their new environments, as is the case with the Siementhal breed in the Vojvodina. In addition, they possess a higher degree of resistance to contagious and other diseases than the same breeds in the countries of origin. The greyish brown Swiss cattle, widespread in Slovenia and to some extent in Croatia, can flourish in many mountainous area in Yugoslavia where the summer pastures are rich. All these breeds are characterized by great milk-producing abilities and rapid growth of progeny. In a year, a calf can attain the weight of 400-500 kilograms, and an adult animal, the weight of 1,000-1,200 kilograms. Moreover, these breeds produce 3,000-4,000 liters of milk annually per cow.

See figure 4 for distribution of cattle in Yugoslavia.

PIG RAISING

Before World War II, pigs were raised mostly in the low-lying, wheat-growing areas and included the domestic breeds of the Mongol, Turopolje /place name/, Morava /place name/, Crna-Slavonska /Black Slavonian/, and the Sumadinka /from the Sumadija/, the most fertile breed being the Mongol. In addition, there were also such breeds as the Chester White, the White Selected, and the Berkshire. They were distributed mainly in dairy areas, such as the northern parts of Slavonia, Croatia, and Slovenia.

Prewar Yugoslavia paid little attention to improving pig raising, being mainly concerned with the export of pigs and pork products. There were no government stations for the production of breeding animals, which were produced

mainly on farms of large landowners and rich farmers. For efficient utilization of breeding animals, there were only the municipality insemination stations in the Vojvodina and the breeding stations established by cooperatives in Slavonia and Slovenia.

Today, pig raising in Yugoslavia surpasses the prewar level. To assure supplies of fats for the population, the fattening of pigs has been organized in the state sector on state farms and in commercial pig fattening centers and is being expanded.

See figure 5 for distribution of pigs in Yugoslavia.

SHEEP RAISING

Sheep raising is widespread throughout Yugoslavia. The terrain is very favorable for raising sheep, particularly in mountainous areas, where vast pastures make possible the raising of large flacks. In the low-lying areas, conditions are also very good for sheep raising.

However, owing to unplanned utilization and poor care of mountain pastures and lack of assistance from the former state government, sheep raising before the war was mostly on a primitive level, and maintenance and care were rudimentary. Feed was insufficient, especially in winter, and provisions for shelter were poor.

The domestic Pramenka breed comprises 95 percent of all the sheep in Yugoslavia. This breed has coarse, mixed wool, and its weight, although relatively low, is resistant to harsh climatic conditions. This breed also has low food requirements and is well adapted to hard conditions.

Some strains of the Pramenka have considerably greater productive capacities, such as the Svrljiska, Sjenicko-pesterska, Ovcepoljska, the Sarplaninska, and others. These strains have been raised in the better mountain pastures, a fact which has resulted in their being better producers.

See figure 6 for distribution of sheep in Yugoslavia.

POULTRY

Poultry raising in Yugoslavia is very diversified because of the character of agricultural production in individual areas and differing conditions for raising poultry in the areas concerned. In wheat-growing areas with better feeding conditions, a large variety of poultry has been developed.

The raising of ducks has been developed near artificial fish ponds, backwaters of rivers, canals, pools, and mud flats. By the use of these natural sources of feeding, it has been possible to raise ducks on a large scale.

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The raising of geese is confined mostly to wheat-growing areas with pastures, where geese find most of their food during the summer.

The raising of turkeys is limited to specific areas, mostly in the Croatian Zagorje.

There are a great many breeds of poultry, but only a few are pure bred.

The pure-bred group includes the Dinarska /Dinaric/ breed, which has been crossbred with the Italian partridge, and Styrian. The latter breed has been bred selectively, resulting in a breed of larger size and of greater egg-producing capacity. In low-lying areas, the Rhode Island is predominant, followed by the Plymouth and cross breeds of it, and the Leghorn.

The influence of foreign breeds on geese, ducks, and turkeys has been slight, so that domestic breeds have, to a large extent, been preserved. Exceptions include ducks crossbred with the Peking breed and turkeys crossbred with the Bronze breed, but the number of such poultry is small.

Poultry raising is receiving much attention in Yugoslavia. Incubator stations are being established in increasing numbers every year on state farms, farm work cooperatives, and state commercial enterprises which purchase eggs and poultry.

State farms and farm work cooperatives are charged with setting up stations for raising poultry-breeding stock, taking into consideration health, resistance, early-maturing, food utilization, and production. Resulting stock is to be used for poultry raising in other raising centers.

See figure 7 for distribution of poultry in Yugoslavia.

The number of poultry in Yugoslavia from 1939 to 1948 was as follows:

Number of Poultry in Yugoslavia, 1939 - 1948 (In thousands)

	Total	Serbia	Croatia	Slovenia	Bosnia-Hercegovina	Macedonia	Montenegro
1939	22,625.6	11,635.8	5,274.9	1,200	2,968.7	1,241	305.2
1945	12,335.6	6,475.1	2,824.7	1,180	1,369.1	545	141.7
1946	15,080.5	8,070.7	3,190.4	1,176	1,766.5	690	186.9
1947	14,723.3	7,359.7	3,684.4	1,045	1,718.4	736	179.8
1948	19,179.8	9,866.3	4,254.1	1,211.1	2,509	1,113.5	225.8

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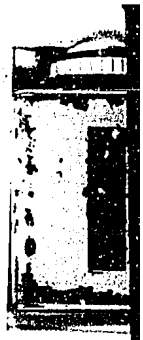

APICULTURE

With large areas in forests, lime trees, and acacias, considerable areas in orchards, and rather large areas in sunflowers, Yugoslavia offers great possibilities for the development of apiculture. These possibilities were not fully utilized in the past, so that apiculture was neglected and backward.

Today, in the republic Ministries of Agriculture, Yugoslavia has Services for Apiculture which manage, study, and utilize existing possibilities for apiculture. By means of courses, the services are increasing trained personnel, introducing modern beehives, transporting bees for the purpose of using seasonal pastures, and setting up apiaries in areas suitable for apiculture.

State farms and farm work cooperatives are obligated to raise bees. To supply specialist personnel to apiaries of state farms, farm work cooperatives, and cooperative apiaries, there are several special training schools where such personnel are being trained.

The state assists the apiculture industry by producing, in state factories and workshops, modern beehives, honey extractors, artificial honeycombs, and placing them at the disposal of beekeepers. The state also provides sugar for feeding in cases when bees cannot procure sufficient quantities of nectar from pastures to last them throughout the winter.

The increase in the number of beehives from 1939 to 1948 is shown by the following:

Increase in Number of Beehives, 1939 - 1948 (In thousands)

	Total	Serbia	Croatia	Slovenia	Bosnia-Hercegovina	Macedonia	Montenegro
1939	780.6	308.7	172.1	68.9	144.6	49	37.3
1945	371.5	184.9	100.2	69.2	--	--	37.3
1946	533.2	217.4	120.9	70.3	86.7	18	19.9
1947	501.5	198.5	139.4	50.1	88.5	--	25
1948	868.1	362.3	148.4	84.1	146.7	86	40.6

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RABBIT RAISING

There is little rabbit raising on farms in Yugoslavia, most of it being done by the city population. Chinchilla and Angora breeds are predominant.

There are several cooperatives in cities for the development of rabbit raising and breeding stock. Shows are held annually at which breeding stock is sold.

Since considerable quantities of meat and wool can be obtained at small cost in well-organized rabbit raising, the state farms have been given the task of developing rabbit raising to a greater extent. Breeding stock is being imported to meet requirements of state farms.

VETERINARY SERVICE

In prewar Yugoslavia, veterinary service was available only to the prosperous. The cost of combating contagious diseases was only partially borne by the state. The production of material for protecting livestock was almost entirely in the hands of private persons. There was no serious scientific research in veterinary service.

Today, the protection of livestock health is the responsibility of the state. Contagious diseases are combated extensively and according to plan. An extensive network of veterinary stations has been established, diagnostic stations are being established, and solid foundations have been laid for veterinary research.

Veterinary establishments have developed as follows:

	1939	1945	1946	1947	1948
Federal Institute for the Veterinary Service	--	--	--	--	1
Veterinary bureaus and diagnostic stations	7	7	10	15	19
Mobile stations and hospitals	1	4	81	120	123
Stations and centers for artificial insemination	--	--	--	14	188
Bureau for the Production of Vaccines, Medicines, and Instruments	3	8	8	6	6

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The extensive application of planned veterinary measures has reduced contagious diseases to a minimum. Immediately after the liberation, 50 to 60 percent of horses had scabies. By the end of 1948, this disease was practically nonexistent. Edema, sheep pox, and sheep scabies have been reduced to a minimum; and anthrax, glanders, and rabies have been reduced perceptibly.

Production of veterinary vaccines is in the hands of the state and generally meets the country's needs. Production of veterinary medicines has been as follows:

	Unit of Measure	1945	1946	1947	1948 (to 15 Nov)
Serums	Liters	54,034	113,611	71,321	81,817 8
Vaccines	Liters	2,983	6,870	10,768	26,625.76
Diagnostic medicines	Liters	76	151	98	104.625
Disinfectants	Kilograms	--	--	212	24,430
Chemicals and pharmeceutical drugs	Kilograms	--	--	40,648,346	75,530,430
	Items	2,366,379	3,000,290	4,752,410	2,764,988
	Bottles	--	--	316	19,141

The number of preventive and curative measures taken has increased as follows:

	Per Head	1939	1945	1946	1947	1948 (to 1 Nov)
Preventive inoculations	1,000	1,420	1,255.5	1,621.5	5,082.3	9,670.6
Diagnostic inoculations	1,000	150	54.5	363.1	431.8	657.1
Medical treatments	1,000	-	41.2	243.3	- 546.1	485.6
Artificial insemination	1,000	-	-	0.082	5.6	121.7 sheep 2.1 cattle

Veterinary personnel has increased as follows:

	1939	1945	1946	1947	1948
Veterinaries	654	697	727	846	902
Assistant veterinaries	--	--	--	47	47
Veterinary hospital technicians	--	77	101	186	317

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	1939	1945	1946	1947	1948
Poultry inoculators	--	--	--	618	618
Livestock health supervisors	--	--	143	216	216
Meat inspectors	--	--	--	457	457
Laboratory assistants	12	12	30	36	36

The following number of auxiliary veterinary personnel have been trained:

	1938-1939*	1945-1946	1946-1947	1947-1948	1948-1949
Students in secondary veterinary schools	--	--	95	450	824
Students in lower veterinary schools or in courses	--	77	101	186	521

* Before the war, there were no auxiliary veterinary personnel in Yugoslavia.

/Appended figures follow./

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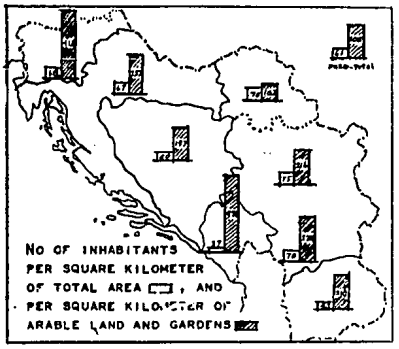
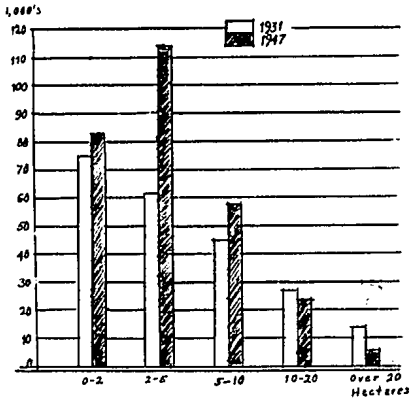
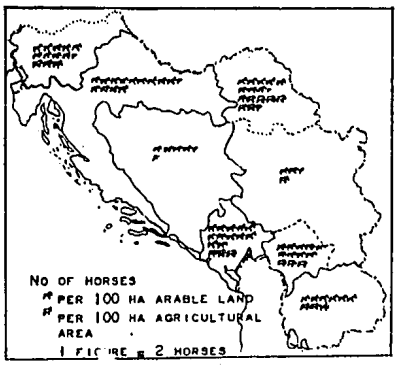


FIGURE 1



LAND HOLDINGS IN THE VOJVODINA IN 1931 AND 1947 (AFTER THE AGRARIAN REFORM)

FIGURE 2



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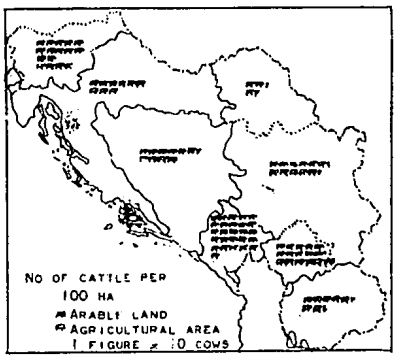

FIGURE 4

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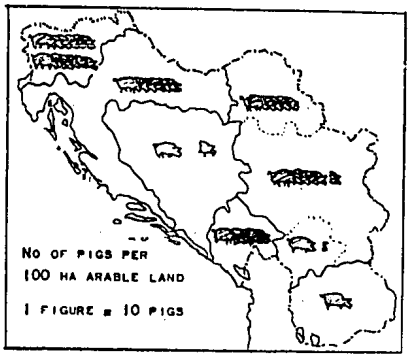

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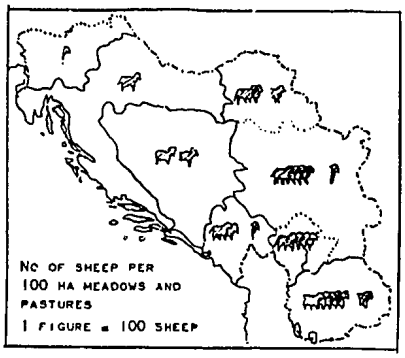

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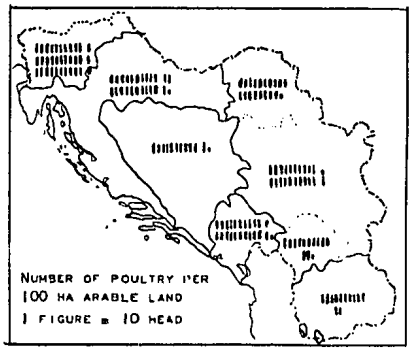

FIGURE 7

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